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Color Connection III

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Color Connection III

Computerware Software Services
Color Connection III

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INTRODUCTION:

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OVERVIEW: Welcome to the World of Telecommunications!

Color Connection III is a program that will convert your computer into a 'smart' terminal. To run this program you need a TRS-80 Color Computer or TDP-100 computer with at least 32K of memory and a disk system. You will also need to have a 300 or 1200 baud modem. Color Connection III was designed to support the auto dial features of either Hayes compatible or Radio Shack autodial modems, but any standard 300 baud modem will work. Since there are many different types of modems, this manual will not try to explain specific details of the operation of your modem. For this information, you should read the manual that came with the modem.

We recommend that you read through this entire manual *before* trying to use Color Connection III. There is important information in every section which will save many questions later. The first section of this manual was written for the first time user with appendixes in the back which contain more technical information for the more experienced user.

With Color Connection III running, you can access a multitude of multi-user computer systems like CompuServe and the Source (often referred to as Vidtext services) and single user bulletin board systems (BBS's) as well as connecting two Color Computers together. There are four versions of Color Connection III. Two are for use with the printer port, and two are for the RS-232 Program Pak. Within each pair, one has 24 lines of 32 upper and lower case characters and the other has 24 lines of 51 upper and lower case characters. In all versions, the 24th line is reserved as a 'status line' which keeps you up to date on the condition of the special features, which include:

1. *The program is entirely menu driven for ease of use. Any options you have are displayed on the screen. You simply select the letter that corresponds to the function you want.*

2. *A buffer that allows you to save anything that is displayed on the screen in memory. This buffer is over 40K in size on a 64K Color Computer.*

3. *There are THREE different UPLOAD and DOWNLOAD protocols: Xon / Xoff, XMODEM (Christensen), and CompuServe Protocol 'B'. You can send or receive files from any BBS or Vidtext service.*

4. *Single key 'macros' (often called programmed function keys) that allow you to type often used things such as user ID numbers or passwords with a single keypress.*

5. *All printable characters are available at the keyboard including some new ones like { } ! ' ~ \. Also, all control characters supported including ESCape, RUB, DEL etc.*

6. *User selectable anti-truncation which will NOT allow a word to wrap from one line to the next.*

GETTING STARTED

Before you do anything else, you should make a backup copy of your Color Connection III disk and put the original in a safe place. If you somehow ruin your working copy, it will be easy to make another one using the saved master disk. Color Connection III has been left copyable because we realize that many people will need to use this program daily. If the disk gets ruined, it is necessary to get another copy immediately. *Please do not abuse this privilege by giving away copies of this software. By doing your part, you can help keep important software products such as this one unprotected in the future. It's up to you...*

SETTING UP YOUR SYSTEM WITH THE COLOR CONNECTION

Before you load Color Connection III, you should set up your computer. This involves turning the power on and connecting the modem between the serial port and the telephone line. Make sure that power is applied to the modem (or that the battery is connected). Now is a good time to read the manual for the modem so that you can connect it correctly.

To load from disk, put the diskette into drive Ø and close the door. Then type LOADM"CON32P" (for the 32 x 24 version) or LOADM"CON51P" (for the 51 x 24 version) and press ENTER. If you are using Radio Shack's RS-232 Program Pak you should use the Color Connection III versions titled CON32R and CON51R. Once the program has loaded, type EXEC and press ENTER to start it up. When the program starts, you will see the Main Menu which should look something like:

```
Connection III Vv.r
(C)1983,1985 Computerware

    FREE: XXXXX

A : Change set-up file
B : Load a set-up file
C : Terminal mode
D : Buffer menu
E : Return to BASIC

INPUT:
```

The v.r is the version and release number. The current number is 1.4 but this may change as we add new features or make any other changes. The XXXXX is the amount of memory available in the RAM buffer.

As you can see, there are 5 main areas to Color Connection III. Each of these is selected by pressing the letter (A-E) next to the area you want to go to (it is not necessary to press ENTER). On the following pages you will find a description of each of these areas.

OPTION A : CHANGE THE SET-UP FILE

Telecommunications has become fairly standardized in recent years. However, there are still slight differences between systems. To make sure that Color Connection III will work with many different host computers, user-modifyable parameters have been included. This means that you can configure Color Connection III to understand different computers. Before you try to use Color Connection III to talk to another computer, you should set-up the program to work correctly with it.

The set-up file contains the information about the system you will be accessing with Color Connection III. Upon pressing A in the Main Menu, you will see a sub-menu that looks something like:

SET-UP

A : 7/8 bits (7/8)	Number of bits per byte
B : Line feed (L/R)	Computer generated line feeds?
C : Parity (N/E/O)	Error checking
D : Echo KBD (N/Y)	Duplex
E : Echo MOD (N/Y)	Duplex
F : Word fix (N/Y)	Allow words to wrap?
G : Video set (N/Y)	Inverse or normal screen
H : Baud Rate(s)	Set Printer & RS232 Pak speeds
I : Phone number	For auto-dial feature
J : Macro 1	
K : Macro 2	
L : Macro 3	
M : Macro 4	
N : Save to disk	Save set-up parameters
O : Main Menu	Return to Main Menu

INPUT:

The values in the parenthesis are all the possible values for the parameters they follow. The first one is the default (the one that is selected when the program first starts running). For most host computers, the default values will work. You should check the information that came with your account number for more information on what to set these parameters to.

NOTE: To respond Yes or No to any prompt, simply press the 'Y' or 'N' key. It is not necessary to press ENTER.

7/8 bits - This parameter controls how many bits are in each byte. The 7 bit option will almost always be the one you should use. The computer will ask you '8 bits ?'. For 8 bits, answer Yes. For 7 bits, answer No. XMODEM protocol will automatically set the system for 8 bits per byte, but will restore your setting after the XMODEM transmission is completed.

Line feed - This parameter controls whether the program will add a line feed to every carriage return sent by the host computer. This is the least standardized option between systems. If you have the line feed parameter set wrong, you will have either overprinting or double spacing on the screen. The computer will ask 'Received line feed ?' If the host is sending line feeds, answer Yes. If Color Connection III should add line feeds, answer No.

Parity - This parameter controls the type of parity used. Parity is a method of checking errors in transmitted data. Many systems do not require that you use parity error checking. If you do need parity, answer the 'Parity ?' prompt with a Yes. Answer the 'Odd ?' prompt with a Yes for odd parity or a No for even parity.

Echo KBD - This and the next parameter control the duplex of Color Connection III. If you answer yes, anything you type at the keyboard will be automatically displayed on the screen.

Echo MOD - This and the previous parameter control the duplex of Color Connection III. If you answer Yes, anything received from the modem will be automatically sent back out the modem ('echoed' back).

Duplex Chart

Duplex	Echo KBD	Echo MOD
Full	No	No
Half	Yes	Yes
Echo	Yes	No

Word fix - This allows you to turn the *word wrap* feature on or off. If you answer Yes to the 'Anti-truncation ?' prompt, no word shorter than 15 characters (this should cover just about everything) will be allowed to wrap from one line to the next. If you answer No, the display will be exactly what the host computer sends to you.

Video set - This allows you to have either white characters on a black background, or black characters on a white background (default). For white characters, answer the 'Inverted video ?' prompt with 'N'. Choose the display mode that looks the best on your TV or monitor.

Baud Rate(s) - This is where you tell Connection III what baud rate to use for your printer. The available speeds are: Ø = 3ØØ baud, 1 = 6ØØ baud, 2 = 12ØØ baud, 3 = 24ØØ baud, 4 = 48ØØ baud, and 5 = 96ØØ baud. If you are using Radio Shack's RS-232 Pak, you can also set the modem baud rate by selecting option 'B'. When using the RS-232 Pak, you MUST select option 'C' and tell Connection III which slot the Pak is in. The default is slot 1.

Phone number - If you are using either a Radio Shack or a Hayes compatible modem, this option will allow you to access the auto-dial features of the modem with a single keystroke. To enter a phone number, press I and answer the '(C)hange ?' prompt with a C. Your next response will tell Connection III whether you are using a Radio Shack modem, Hayes compatible modem, or want to use the phone number slot as an additional 2Ø character Macro. If you have an autodial Radio Shack modem, enter 'R' for number of tries. If you want this for Macro space, enter an 'M'.

For *Hayes compatible modems*, enter the number of tries (1-9) that you want the modem to make. 2 or 3 is usually enough. Finally, Hayes compatible users should enter the phone number preceded by DT for touch tone dialing or DP for pulse dialing. See your Smartmodem manual for more details (the 'AT' is added automatically). Radio Shack Modem users should also refer to their manual for specifics, but in general the format is *DTnnnnnnnnX, where nnnnnnn is the phone number sequence desired. If you are on a rotary dial system instead of tone dialing, use *DS preceeding the phone number.

Macros - Options J - M allow you to define your own custom macros (programmed function keys). Each macro may contain up to 4Ø characters. To define (or re-define) a macro, press the letter next to the one you want to modify. Answer the '(C)hange ?' prompt with a C and then enter your macro. Be careful not to type more than 4Ø characters because anything after the 4Øth will be lost.

Save to disk - Once you have customized Color Connection III to work for your system, you will want to save the set-up file for later use. After pressing N, you will be asked for the filename to save the set-up file under. Make sure the disk is ready to receive a file, type up to eight characters (the filename) and press ENTER. From now on, you simply need to load the set-up file (from the Main Menu) to set up all the parameters and macros. You can save as many set-up files (with different filenames, of course) as you need and just load the one that works with the system you intend to access. If you want to save a set-up file using the same name as a previously defined file, enter the same name and then respond 'Y' when asked if you want to replace the existing set-up file. As the case anytime you are presented with the FILENAME: prompt, if you enter Ø-3, that drive's directory will be displayed to you.

Main Menu - This option simply returns you to the Main Menu so you can do other things.

OPTION B : LOAD A SET-UP FILE

This option allows you to re-load any previously saved set-up file. This is a way to configure Color Connection III quickly each time you need to use it with a different system.

OPTION C : TERMINAL MODE

This is where you will spend most of your time while using Color Connection. When you press C, the screen will clear and the bottom line will display:

ON: OFF: X FREE: XXXXX

You are now connected directly to the modem. While in the Terminal Mode, there is no menu displayed. All commands are called by entering a control character. Since there is not a control key (often abbreviated CTL or CTRL) on the Color Computer's keyboard, the CLEAR key has been given this function. To type a control character, simply hold the CLEAR key down and type the character you need. For example, to type CTL-C hold the CLEAR key while you type the letter C. All control sequences listed in Appendix F will work in the terminal mode. It should be noted that since Color Connection III is typically set with BOTH echo keyboard and echo modem OFF, you will not see anything displayed on the screen when in terminal mode until you make connection with another computer. If you are using a Hayes compatible 'smart' modem, your typing AT? will generally get the modem to list its menu of most often used commands on your screen. Another way to insure yourself that you have mastered the use of control sequences is to type CTL 1 (CLEAR and 1 at the same time) and watch to see the buffer status indicator at the bottom of the screen move to the ON position. The most often used Terminal Mode control commands are listed below:

CTL 1 = Open the buffer

Everything that is transmitted to you after you type a CTL 1 will be stored in memory for later use. Color Connection III requires that you give it a FILENAME whenever you open up the buffer (see Appendix A). Generally, you will not be required to save the buffer to disk, but to allow many of the automatic features to function properly, a filename must be given. *Be sure to have space on the disk drive specified in your filename in case you do want to save the buffer to disk.* See Appendix D: Xon / Xoff Protocol for more on the workings of the buffer and disk files. The amount of buffer memory left is displayed on the bottom of the screen. When the buffer fills up, it will automatically write to disk. To avoid this, you should occasionally clear it with a CTL 3.

CTL 2 = Close the buffer
This stops information from being stored in the buffer. At this time, you will be asked whether you want to save the buffer to disk. Answering 'Y' will save the buffer, clear the buffer and then close the buffer. Answering 'N' will close the buffer, allowing it to be re-opened at another time. This does not disconnect you from the other computer.

CTL 3 = Erase the buffer
This clears out anything that was in the buffer. Since your buffer will automatically be saved to disk when it gets close to full, the primary purpose of this option is to clear the buffer of information that you do not want to save.

CTL 4 = Dial the Autodial modem
If you are using a Hayes compatible or Radio Shack modem, this will make it call the phone number you specified in the set-up file. If you want to stop before the specified number of attempts has been completed, just press the BREAK key.

CTL 5 = Transmit Macro #1
This is how you transmit the macros that you specified in the set-up file. If you want to stop the macro before it is finished, press the BREAK key.

CTL 6 = Transmit Macro #2

CTL 7 = Transmit Macro #3

CTL 8 = Transmit Macro #4

CTL 9 = Dump buffer
Transmit the entire contents of the buffer to the other computer. This is for ASCII files only and allows you to prepare letters, messages, etc. in advance and then 'block' transmit them to the other computer. This works well for MCI mail or Western Union's Easylink.

CTL Ø = Return to the Main Menu

This allows you to change the set-up file, print the buffer or any number of other things while the other computer waits. To reconnect with the other computer, just select C from the Main Menu. The screen will be cleared, but you will still be where you were when you typed CTL Ø. If your buffer was open while in the terminal mode, you will be asked if you want to save the buffer. If you will be returning and want to continue to add to it, or if your reason for exiting was to print the buffer, you can respond 'N' and leave everything intact. If you answer 'Y', the buffer will be saved, cleared, and closed.

CTL < = XMODEM Receive file

This allows you to receive any type of file and save it directly to disk while receiving it. After pressing CTL < (remember you must use shift to get the '<' character), you will see the message: RECEIVE FILE; FILENAME:. At this time enter in the name that you want the file saved to disk as. Review Appendix A on filename conventions if you are unsure as to what should be entered. Color Connection III recognizes standard Color Computer file extensions of BIN (binary files), TXT (all ASCII files), BAS (tokened BASIC programs), and DAT (data files). It will automatically set the proper 'flags' in the disk directory for these files. ***Please note that TXT must be used for all ASCII type files.*** If you are receiving a BASIC program that is in ASCII format rather than tokened, use TXT rather than BAS as the extension. There is a description of XMODEM or Christensen protocol in Appendix C.

CTL > = XMODEM Send file

This allows you to send any type of file to another computer that understands XMODEM or Christensen protocol. After pressing CTL > (remember you must use shift to get the '>' character), you will see the message: SEND FILE; FILENAME:. At this time enter in the name that you want to send. Review Appendix A on filename conventions if you are unsure as to what should be entered.

CTL L = Clear the screen

CTL Q = Send an Xon (DC1) character

CTL S = Send an Xoff (DC3) character

OPTION D : THE BUFFER MENU

The Buffer Menu gives you control over the contents of the buffer. Upon pressing D in the Main Menu, you will see:

```
Buffer menu

A : View buffer
B : Print Buffer
C : Disk to buffer
D : Keyboard to buffer
E : Main menu

INPUT:
```

View buffer - This allows you to look at what is in the buffer and also to save only specific parts of the buffer. While viewing the buffer, you can:

What to type	What it does
Up arrow	Display the previous line
Down arrow	Display the next line
CLEAR	Erase the screen
ENTER	Return to the menu
T	move to the top of the buffer
B	move to the bottom of the buffer
O	Open a file for storage. Any line that is displayed while a file is open will be saved into the filename you specify.
V	Temporarily stop writing lines to an open file. This allows you to skip a number of lines. Press O to continue writing displayed lines to the file.
C	Close any open file

Print Buffer - After you press B, you will be asked to Ready the printer and then press ENTER. At this time, your buffer will be directed to the printer at the BAUD rate you specified in your set-up file. After the printing, a message will appear asking you to Ready the modem and then press ENTER. You need only do this if you plan on continuing to use your modem.

Disk to buffer - This allows you to load any TEXT file into the buffer. This may be useful to load a letter or program (saved in ASCII format!) and quickly upload it to the host computer. After you press C, you will be asked for the name of the file to load. Upon completion, the file you specified (if it existed) will be in the buffer.

Keyboard to buffer - This is an easy way to enter short letters etc. into the buffer. Enter the information you want and then press the BREAK key to return to the menu.

Main Menu - returns you to the Main Menu.

NOTE: Color Connection III reads and writes standard ASCII text files. Since there are no editing functions in the keyboard to buffer area, we recommend that you create anything longer than a short letter using a text editor and then just load the file into the buffer. Also, any file that is saved from the buffer can be edited by most text editors (like our Color Scribe). To load a BASIC program into the buffer, you must first save it in ASCII format using the SAVE"FILENAME",A format.

OPTION E : RETURN TO BASIC

This is the way out of Color Connection III. If you had your buffer open while in the terminal mode and have not yet saved it, you will, for the absolute LAST time, be asked if you want to save the buffer...

APPENDIX A - Filename Conventions

Color Connection III will occasionally ask you for a filename. The filename you enter should consist of at least TWO, but no more than EIGHT characters plus a three character extension. You may want to include a drive number in order to access a file on a drive other than Ø. For example:

Enter filename : 1:MYFILE1.TXT or MYFILE1/TXT:1

The '1:' or ':1' tells Color Connection III to look on drive 1 for the specified file. This format is exactly the same as BASIC's with the exception that you do NOT need to use quotes.

NOTE: Disk system users - If you do NOT specify an extension on your filename, Color Connection III will use .MOD for loading and saving Set-up files and .TXT for loading and saving all other files. When using the XMODEM options, it is important that you specify an extension of either BIN, TXT, BAS or DAT, depending on the type of file being transferred. Also, anytime that you see the FILENAME: prompt, just enter a number from Ø to 3, and the directory of that drive will be displayed for you.

APPENDIX B - Making a Connection

In order to make the connection with another computer, follow the steps below. You should have your modem manual handy while you try this for the first time.

1. Loadm Color Connection III into your computer and EXEC. Also make sure that your modem is properly connected between the computer and the phone line.

2. Check to be sure that the set-up file matches the system you intend to use. If it doesn't, make any changes needed or load the proper saved set-up file. As an example, CompuServe is 'happy' with the following settings: (8) bits, (R)eceived line feed, (N)o parity, (N)o echo keyboard, and (N)o echo modem. You can set word fix and video set to your own liking.

   NOTE: To make a connection between two Color Computers, both should be set for Echo duplex or one set for Half duplex and the other set for Full duplex. Either combination will work equally well.

3. Press C to enter the Terminal Mode.

4a. If you are using a Hayes compatible modem or the Radio Shack Modem II, and you entered a phone number into the set-up file, simply type CTL 4 and that number will be dialed. If you set up the phone number area as a extra Macro buffer, then CTL 4 will transmit the buffer.

4b. If you are not using the auto-dial modem, you should dial the number manually and wait for the modem on the other end to make a whistling sound. When this happens, you should follow the instructions that came with the modem to complete the connection. This will usually be either setting the receiver into a set of cups (for acoustic modems), and/or flipping a switch into the ON or ORIGINATE position.

5. If everything worked properly, you are now in contact with the other computer. All that is left to do is log on. This works differently on each system but will usually involve entering the name of the service you want to use and then your user number and password. Most of the BBS's will not require that you log on. Specific log on details should be included with the information that you got with your account number.

   NOTES: If you are using a Tymnet port for access, your terminal identifier is 'A'. For Telenet, use 'D1'.

APPENDIX C - XMODEM Protocol

XMODEM or Christensen Protocol has become the most common form of transmitting data between computers via modem. Even though the following description of XMODEM protocol is slightly technical, we suggest that you read it to gain a better understanding of what the XMODEM transfer messages mean.

Data is sent in blocks of 128 data bytes, with four bytes added for control purposes. Format is:

<SOH>	is the ASCII start-of-header, $Ø1.
<BLKNR>	starts at $Ø1 and wraps around past $FF.
<NOT-BLKNR>	is the ones complement of BLKNR, e.g., not ($Ø1) is $FE.
<128 DATA>	is data from the disk file.
<CKSUM>	is the sum of the 128 data bytes.

As each block is received, it is checked to see if it is in sequence. Next, a check is made to see if (NOT-BLKNR> is in fact the ones complement of the block number. Finally, the check sum is tested. If all these tests are passed, the block is considered to be received correctly.

If incorrect, a message is displayed saying "REC'D # NN IN ERROR" where NN is the DECIMAL block number. Then, an ASCII "NEGATIVE ACKNOWLEDGE" (NAK, $15) is transmitted to the sender, who repeats the block. Each block will be sent up to ten times before Connection III gives up and displays "TEN NAKS - ABORT".

If correct, "REC'D #NN" is displayed and the buffer is saved to disk. Next, Color Connection III transmits an ASCII "ACKNOWLEDGE" (ACK,$Ø6) to the sending computer, which proceeds to send the next block.

If the sender receives neither ACK or NAK in ten seconds, it assumes an error and retransmits the last block sent. This counts as one of the ten tries.

The last block sent is padded with NULLs. Following acknowledgement of the last block, the sender transmits an ASCII "END OF TRANSMISSION" (EOT,$Ø4) to notify Color Connection III that nothing follows. This transmission also must be ACKed, or the sender repeats it.

If you want to receive a file via XMODEM, not all, but many systems would send the file after receiving the following: (you type) XMODEM S filename (you supply filename). The sending system would then send you a message telling you to get ready to receive. At this time, you would type CTL < to tell Connection III to get ready to receive. Color Connection III would also prompt you for a file name for your disk directory. The transmission would then take place as described above. (See Appendix D for more information on XMODEM and your buffer).

APPENDIX D - Xon / Xoff Protocol and Your Buffer

Most Information Services and bulletin boards handshake with what is called Xon / Xoff protocol. This means that they are 'listening' for Xon / Xoff feedback from you to tell them whether or not to transmit information. Color Connection III uses this protocol. Typically, it is invisible to the user, except for when Color Connection's buffer fills. At this time, Color Connection III will transmit an Xoff to the other computer, asking it to stop sending until it receives an Xon. Color Connection III will then automatically write out the contents of the buffer to disk (why you had to give a filename in advance). The buffer will then be cleared and you are now ready to receive more information. You will not be prompted for another filename because the existing file will be kept open for the rest of the incoming information.

NOTE: If you are connected to a bulletin board that does not support Xon / Xoff protocol, you should manually write the buffer before it fills, by closing it and then re-opening it. In this manual mode, you will be prompted for a new filename since Color Connection III treats each opening and closing as a separate file.

If you have your buffer open, have filled it, automatically saved it to disk, and then request XMODEM or CompuServe 'B' Protocol, Connection III will then save the rest of your buffer and then close the file. Only one file type may be open at a time. However, if you have only opened your buffer and not yet written to disk, you will be prompted 'Save Buffer (Y/N)'. Answering 'N' will cause your buffer to be closed. Answering 'Y' will cause the buffer to be written to disk, then cleared and closed. If you intend on re-opening the buffer after the file transmission, you most likely would respond 'N' to the save buffer prompt. Since the file has not yet been written to disk, you will not be prompted for a filename when re-opening the buffer.

The control sequence for Xon is CTL Q, and Xoff is CTL S. These can be manually sent while in the terminal mode by pressing the CLEAR key and either the Q or S at the same time.

APPENDIX E - CompuServe Upload / Download Protocol 'B'

Color Connection III also supports CompuServe's protocol 'B'. This protocol is used on CompuServe exclusively, and Color Connection III is automatically recognized by CompuServe as supporting their upload / download protocol. This automatic recognition makes file transfers with CompuServe quite easy, but before going into how it works, we will define some of the terms that you might see on Compuserve:

HOST - the Compuserve mainframe computer

REMOTE - your microcomputer

UPLOAD - transferring a file from the REMOTE to the HOST

DOWNLOAD - transferring a file from the HOST to the REMOTE

BAS - filename extension for a BASIC file

BIN - filename extension for a binary file

TXT - filename extension for a text file

To get quickly to the Color Computer (S)pecial (I)interest (G)roup (SIG) section, type GO PCS-126 after you log-on. Then entering a '4' for Data Library will get you to the menu showing the different catagories of files available. After selecting the catagory of interest to you, you will get another sub-menu that allows getting more information about the files and also, uploading and downloading. Uploading is option '4' and downloading is option '5' and they work basically the same way. As an example, after you've found something that you want to download and have selected option '5', you will be asked for the CompuServe file name. After entering that name, you next will be asked for the filename for your computer. Enter the name and extension that you want the file on your disk to be called, or if an upload, this it is called. Standard Color Computer naming conventions, including drive number, etc. should be observed.

After all of the above information is entered, CompuServe will begin the file transfer. As the transfer is proceeding, a series of digits separated by plus signs will be displayed on your screen. When the transfer is completed, CompuServe will display a message that says: Key <ENTER> to continue.

REMEMBER: if your buffer was open, you will get the 'Save Buffer (Y/N)' prompt as described in Appendix D.

NOTE: You must be set for EIGHT (8) bits when using CompuServe's Upload and Download features.

APPENDIX F - Control Key Summary (Terminal Mode)

KEY FUNCTION

NOTE: Use the CLEAR key for CTL.

COMMANDS

CTL 1 = Open the buffer
CTL 2 = Close the buffer
CTL 3 = Erase the buffer
CTL 4 = Dial the Smartmodem
CTL 5 = Transmit Macro #1
CTL 6 = Transmit Macro #2
CTL 7 = Transmit Macro #3
CTL 8 = Transmit Macro #4
CTL 9 = Transmit buffer
CTL Ø = Return to Main Menu
CTL < = XMODEM Receive File
CTL > = XMODEM Send File

SPECIAL FUNCTIONS

CTL K = Move the cursor up one line

CTL L = Clear the screen

CTL * or CTL ; = Send: +++ (wait) ATZ (Smart Modem Hang-up)

SPECIAL CHARACTERS

CTL Q = Send an Xon (DC1)

CTL S = Send an Xoff (DC3)

CTL - = Send a DEL character (ASCII 127)

CTL @ = send a NUL character (ASCII Ø)

CTL " = {

CTL # = |

CTL $ = }

CTL % = ~

CTL SHIFT UP-ARROW = send an escape (ESC) character (ASCII 27)

SHIFT DOWN-ARROW = send [character

SHIFT RIGHT ARROW = send] character

SHIFT UP-ARROW = send left arrow character

SHIFT LEFT-ARROW = send \ character

SHIFT @ = send ‘ character

APPENDIX G - Character Conversion Table

ASCII	CTL	HEX	DEC
NUL	@	ØØ	ØØ
SOH	A	Ø1	Ø1
STX	B	Ø2	Ø2
ETX	C	Ø3	Ø3
EOT	D	Ø4	Ø4
ENQ	E	Ø5	Ø5
ACK	F	Ø6	Ø6
BEL	G	Ø7	Ø7
BS	H	Ø8	Ø8
HT	I	Ø9	Ø9
LF	J	ØA	1Ø
VT	K	ØB	11
FF	L	ØC	12
CR	M	ØD	13
SO	N	ØE	14
SI	O	ØF	15
DLE	P	1Ø	16
Xon	Q	11	17
DC2	R	12	18
Xoff	S	13	19
DC4	T	14	2Ø
NAK	U	15	21
SYN	V	16	22
ETB	W	17	23
CAN	X	18	24
EM	Y	19	25
SUB	Z	1A	26
ESC	[	1B	27
FS	\	1C	28
GS	]	1D	29
RS	^	1E	3Ø
US	_	1F	31
SP		2Ø	32
	!	21	33
	"	22	34
	#	23	35
	$	24	36
	%	25	37
	&	26	38
	'	27	39
	(	28	4Ø
	)	29	41
	*	2A	42
	+	2B	43

ASCII	HEX	DEC
,	2C	44
-	2D	45
.	2E	46
/	2F	47
Ø	3Ø	48
1	31	49
2	32	5Ø
3	33	51
4	34	52
5	35	53
6	36	54
7	37	55
8	38	56
9	39	57
:	3A	58
;	3B	59
<	3C	6Ø
=	3D	61
>	3E	62
?	3F	63
@	4Ø	64
A	41	65
B	42	66
C	43	67
D	44	68
E	45	69
F	46	7Ø
G	47	71
H	48	72
I	49	73
J	4A	74
K	4B	75
L	4C	76
M	4D	77
N	4E	78
O	4F	79
P	5Ø	8Ø
Q	51	81
R	52	82
S	53	83
T	54	84
U	55	85
V	56	86
W	57	87

ASCII	HEX	DEC
X	58	88
Y	59	89
Z	5A	9Ø
[	5B	91
\	5C	92
]	5D	93
^	5E	94
_	5F	95
`	6Ø	96
a	61	97
b	62	98
c	63	99
d	64	1ØØ
e	65	1Ø1
f	66	1Ø2
g	67	1Ø3
h	68	1Ø4
i	69	1Ø5
j	6A	1Ø6
k	6B	1Ø7
l	6C	1Ø8
m	6D	1Ø9
n	6E	11Ø
o	6F	111
p	7Ø	112
q	71	113
r	72	114
s	73	115
t	74	116
u	75	117
v	76	118
w	77	119
x	78	12Ø
y	79	121
z	7A	122
{	7B	123
¦	7C	124
}	7D	125
~	7E	126
DEL	7F	127

APPENDIX H - Printing a Saved Buffer

Once you have saved the buffer to disk, you will probably want to print it. By typing in the following BASIC program, you can do just that.

```
100 CLS:INPUT"READ FILE FROM (T)APE OR (D)ISK ";X$
110 IF X$="T" THEN F=-1 : GOTO 140
120 IF X$<>"D" THEN 100
130 F=1
140 INPUT"PRINT TO (S)CREEN OR (P)RINTER ";X$
150 IF X$="S" THEN U=0 : GOTO 180
160 IF X$<>"P" THEN 140
170 U=-2
180 INPUT"FILENAME TO PRINT ";F$
190 IF F=-1 THEN INPUT"SET UP TAPE AND PRESS ENTER";X$
200 OPEN"I",#F,F$
210 INPUT#F,A$
220 PRINT#U,A$
230 IF EOF(F)=0 THEN 210
240 CLOSE#F : END
```

APPENDIX I - If you have a problem

If you experience a problem using Color Connection III, check the following list. If the problem you are having is not covered, the quickest way to get help is to send a letter to Computerware describing in as much detail as possible the problem you are having. You should also include your ORIGINAL cassette or disk so that we can be sure that you have the current version of the program. We will research the problem and get back to you as quickly as possible.

PROBLEM	WHAT TO CHECK
Unable to make a connection nothing printed on screen	- Is the modem connected correctly and power turned on? - Is the cable between the modem and the computer OK?
Connection made but only junk displayed on screen	- Make sure parity and number of data bits are set correctly for this host computer.
Occasional graphics blocks displayed on screen	- Set for for 7 bits
Losing characters on up or down loading	- Is the PROMPT character set correctly? - Is the line DELAY long enough?
Trouble accessing an IBM mainframe in half duplex	- Set for ECHO duplex

INTRODUCTION TO DATA COMMUNICATIONS

Intro to Data Communications is a five part program designed to teach a beginner the basic ideas and terminology to allow him (her) to use a data communications device easily. The last part of this manual is a glossary of the most often used terms in data communications. If you have any questions as the course is running, this may answer them. This program is written to run in a 16K Color Computer with Extended Basic. To run the programs from disk:

1. *Put the disk in drive Ø and close the door.*
2. *Type RUN"DATCOM1D and press the ENTER key.*
3. *When a part finishes, it will automatically run the next part.*

The programs themselves are self-explanatory. If you want to see a part over before running the next part, simply press the BREAK key before loading the next part and then type RUN followed by ENTER. On disk, the filenames all end with a "D" (DATCOM1D, DATACOM2D, etc.). If you want to run a specific part, just type RUN"(filename).

At the end of part four is a test to see if you have learned the material presented. When you type your response to a question, you will hear either a high or a low tone. The high tone indicates a correct answer and the low tone indicates an incorrect answer. At the end of the ten questions you will be given your final score. If you don't do well, you may want to run the programs again.

DATA COMMUNICATIONS

GLOSSARY

ACOUSTIC COUPLER - A modem which physically holds a telephone handset in two rubber cups and sound is transfered to and from the handset via sound transducers.

ANALOG - A signal which smoothly transitions from one level to another, such as an audio signal. (See Sine Wave)

ANSWER MODE - Usually used in reference to low speed dial modems. In this mode, your modem will use 1270Hz and 1070Hz tones to represent the ones and zero's in the data.

ASCII - (A)merican (S)tandard (C)ode for (I)nformation (I)nterchange. This is a method of coding digital signals. It uses eight bits - seven data bits and 1 parity bit - to represent various characters. For example, the character "1" is represented by 00110001.

ASYNCHRONOUS - A method of data transmission in which start and stop bits are used to synchronize the timing of the transmission of characters. (See Synchronous)

BAUD - A unit of signaling speed. In most low speed modems, one baud corresponds to one signal element (character) per second.

BELL 103 - Modem protocol using four tones for full duplex operation on a single channel. Usually used at 300 baud.

BIT - The smallest unit of digital information - a 1 or a 0.

BPS - (B)its (P)er (S)econd. This is the speed at which bits are transmitted.

BYTE - A group of bits. In the Color Computer (and most other personal computers), there are eight bits in a byte.

CPU - (C)entral (P)rocessing (U)nit. Usually refers to a large computer installation. Can also refer to the main computer chip in a micro- computer. The Color Computer uses a 6809 CPU chip.

DB - Decibel. Used in data communications as a measurement of power.

DB-25 - The name given to the most common plug and jack set used in RS232 wiring. These connectors have 25 pins - 13 in the top row and 12 in the bottom. The Color Computer does NOT use these. It uses DIN type connectors instead.

DCE - (D)ata (C)ommunications (E)quipment. Modems, terminals, etc.

GLOSSARY (Cont.)

DDD - (D)irect (D)istance (D)ialing. Telephone service enabling a user to dial directly to other telephones outside his (her) local area without the assistance of an operator. Most people in the United States have this type of phone service.

DIGITAL - A signal which has two discreet states which signify either a one or a zero.

DIN - The type of connector the CoCo uses to interface with the cassette player, joysticks and the RS232 communications line. These connectors usually have between 3 and 7 pins.

DIRECT CONNECT - The type of modem that is wired directly to the phone line. Depending on the design, the connection can be made between the handset and the phone or between the phone and the wall.

DOWNLOAD - This means to take some information from the host computer and store it in your memory for later use. On many systems, you can download BASIC programs or graphics pictures.

DTE - (D)ata (T)erminal (E)quipment. This usually refers to a remote data terminal, printer, computer, etc.

EIA - (E)lectronic (I)ndustries (A)ssociation. This is an organization which sets standards in the electronics industry.

FSK - (F)requency (S)hift (K)eying. This is the type of frequency modulation used by most low speed modems.

FULL DUPLEX - The mode of data communications where data is transmitted in two directions simultaneously. If your terminal is in this mode, the host computer must echo (return) any character you type or you will not see it displayed.

HALF DUPLEX - The mode of data communications where data is transmitted in only one direction at a time. In this mode, the terminal automatically displays any character typed as soon as it is transmitted. This is the most common mode for remote terminals.

HERTZ - (Hz) a unit of frequency equal to one cycle per second.

HOST - The name given to the computer you are talking to. Usually used in reference to a large computer with many users such as the Source.

INPUT - Information arriving at (going into) a device.

INTERFACE - Any circuit that allows two different devices to communicate with one another. A modem is a type of interface.

MARK - The name given to the signal condition that represents a binary 1.

GLOSSARY (Cont.)

MODEM - A device that translates between digital and analog signals. The analog signals or audio tones are then usually sent over the phone lines. MODulator-DEModulator.

MULTI-USER - A type of host computer that can talk to more than one user at the same time. Some can talk to hundreds of users at once. This requires a large, extremely fast computer.

ORIGINATE MODE - Usually used in reference to low speed dial modems. In this mode, the modem uses 2225Hz to represent ones and 2Ø25Hz tones to represent zeros.

OUTPUT - Information leaving from (going out of) a device.

PARITY - A way of detecting errors in transmitted data. All the ones in a characters data are added up and the parity bit (8th bit) is either set or not set so as to make the total number of ones even or odd. (Odd parity or Even parity). This even or odd count can be checked during transmission to detect data errors.

PERIPHERAL - A device that can send information to and/or receive information from a computer. Some examples are printers, modems, TV sets, etc.

PUBLIC DIAL NETWORK - Telephone facilities used by the public dial telephones.

RS232 - An electrical standard of interconnection established by the EIA. The Color Computer talks to a modem through its RS232 interface.

SINE WAVE - An analog signal's wave form.

SINGLE-USER - A type of host computer that can only talk to one user at a time. Most Bulletin Boards (BB's) are like this.

SPACE - The name given to the signal condition that represents a binary Ø.

SQUARE WAVE - A digital signal's wave form.

SYNCHRONOUS - A method of data transmission in which the characters are timed or synchronized by synch characters. No start or stop bits are used.

UPLOAD - To send information to the host computer for it to store. This is usually BASIC programs or letters for electronic mail services.

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